18.5200

S/121/60/000/006/001/008

AUTHORS: Kamenir, Ya. A., Rapoport, G. N.

TITLE: Hydraulectric Two-Coordinate Tracer Drive for Profile Copying

PERIODICAL: Stanki i Instrument, 1960, No. 6, pp. 1-4

TEXT: The authors point out that machine parts of complex configuration are to an increasing extent tooled on copying milling machines 14 equipped with two-coordinate hydraulic or electric tracer systems. 14 However, 14 these machines showed a number of deficiencies resulting from the application of either purely hydraulic or purely electric drives. Therefore the authors developed a tracer drive system in which the advantages of electronics in the measuring 14 and control sections are combined with those of the hydraulic drive, being less inert, in the power section of the machine. This combination makes it possible to obtain higher 14 feed speeds (up to 1,200 mm/min) in the tracing system of copying machine tools compared to those of machines with either hydraulic or electric drive, under consideration of the errors permissible in copying practice (± 0.1 mm). In this system copying errors do not depend on the magnitude of feed speed for each of the coordinates, but only on the curvature of the profile to be machined. If 1X

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S/121/60/000/006/001/008

Hydraulectric Two-Coordinate Tracer Drive for Profile Copying

hydraulic drives with adjustable pump discharge are used which possess a more rigid mechanical characteristic, are less sensitive against overcharging and ensure a higher efficiency than hydraulic drives with throttle regulation, it is possible to equip heavy duty machine tools of great feeds with the suggested tracer drive. There are 5 diagrams and 2 block-diagrams.

Card 2/2

AUTHOR: **Rapoport, G.N.** S/142/60/000/01/017/022
E140/E335

TITLE: Excitation of a Cavity Resonator 25 by a Curvilinear Electron Beam 21 with Periodically Varying Electron Trajectories 21

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, 1960, 3 Nr 1, p 122 (USSR)

ABSTRACT: An expression is found for the field in such a system as a functional of the characteristics of electron motion. The solution is found in terms of the kinematic characteristics for cylindrical resonators and waveguides. The solution is obtained on the assumption that the electron beam does not intersect the side walls of the system and for a given current distribution. There are 5 Soviet references.

SUBMITTED: July 2, 1959

Card 1/1

/B

69330

S/109/60/005/04/014/028
E140/E435

9.1300

AUTHOR: Rapoport, G.N.

TITLE: Waveguide Excitation by an Electron Beam with Periodically Varying Trajectories

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 4, pp 649-653 (USSR)

ABSTRACT: This paper was presented at the Seminar of the Institute of Radio Engineering and Electronics of the Academy of Sciences of the USSR, March 1959.

A general solution is given of the problem of representing the high-frequency field excited by an electron flow in a cylindrical waveguide directly in terms of the characteristics of electron motion, whose velocity varies periodically not only in magnitude but in direction. The solution is first obtained under the assumption that the electron trajectories do not intersect the waveguide envelope and do not have reversal points. The method is based on Vaynshteyn's 1953 paper (Ref 4). Formulae (1), (12) to (14) completely define the solution of the problem posed. An example of the excitation of a waveguide

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69300

S/109/60/005/04/014/026
E140/E435

Waveguide Excitation by an Electron Beam with Periodically Varying Trajectories

by a helical electron stream is then solved to illustrate the method. The initial restrictions are not fundamental. With contacting of the waveguide envelope by the beam it is only necessary to introduce corresponding limits of integration into Eq (12) and (14). In the presence of reverse current, it is sufficient to sum the integrands of Eq (12) and (14) over all points of intersection of the given plane z by a given trajectory (4). There are 12 references, 9 of which are Soviet, 2 English and 1 Russian translation from English.

SUBMITTED: July 6, 1959

Card 2/2

KAMENIR, Ya.A.; RAPOPORT, G.N.

Electrohydraulic two-coordinate servodrive for contour copying. Stan. i instr. 31 no. 6:1-4 Je '60. (MIRA 14:2)

(Servomechanisms)

20579

9,4231

S/109/61/006/002/011/023
E140/E435

AUTHOR: Rapoport, G.N.

TITLE: Strong-Signal Operation of Backward-Wave Amplifier

PERIODICAL: Radiotekhnika i elektronika, 1961, Vol.6, No.2, pp.261-266

TEXT: The author deals with the calculation of amplification and efficiency of the backward-wave amplifier, taking into account non-linear effects, and the limits of applicability of the linear theory (weak-signal theory) are established. For the TWT substantial deviations from the linear theory occur only at output powers exceeding 0.4 to 0.6 of the saturation power. This permits the successful use of the weak-signal theory in the practical design of TWT. Due to the regeneration in the BWT non-linear effects are more important, particularly as the electron current approaches critical. The analysis given here is based on the approximate model and the system of equations for the BWT developed in the author's previous publications (Ref.4 and 5). To simplify the calculations, the influence of space charge is neglected. The system of integro-differential equations of the model considered can be reduced approximately to a system of

X

Card 1/2

20579

S/109/61/006/002/011/023
Strong-Signal Operation ... E140/E435

34 ordinary (non-linear) first-order differential equations by substituting the initial continuous electron distribution with respect to phase by a discrete distribution with 16 equidistant initial phases. The system was integrated numerically on the electronic computer "URAL" using a fourth-order Runge-Kutte method. Curves of a number of tube parameters are given in terms of input and output signal amplitudes, normalized input power etc. It is shown that non-linear effects become important already at powers not exceeding 10 to 15% of the saturation power, with efficiencies less than 1%. A discussion on synchronization of BWT oscillators by small external signals is given. The results indicate the theoretical possibility of using the synchronized tube as a narrow-band amplifier for modulated signals with limited bandwidth. In conclusion, it is remarked that a further development of the theory requires consideration of asynchronous operation and determination of the limits of stability of the synchronous regime. There are 6 figures and 7 references: 4 Soviet and 3 non-Soviet.

SUBMITTED: May 9, 1960

Card 2/2

RAPOPORT, G. [Rapoport, H.], kand.tekhn.nauk

Space communication in action. Znan. ta pratsia no.10:10-11 O '61. (MIRA 14:8)
(Television)
(Artificial satellites in telecommunication)

S/141/62/005/001/023/024
E039/E485

9,4330

AUTHOR: Rapoport, G.N.

TITLE: Method of approximation in the nonlinear theory of TW tubes

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Radiofizika, v.5, no.1, 1962, 191-192

TEXT: The theory of signal strength in TW tubes makes use of a system of integro-differential equations relating the amplitude of high frequency fields and the function τ(α, x), defining the dependence of time of flight of electrons τ on coordinate x and initial phase α. It is usual to use the method of approximation to reduce these systems to differential equations. Alternatively, in the method previously reported by the author it is assumed that τ(α, x) is a periodic function of α and can be approximated to by a finite Fourier summation. By taking the first two terms in this summation approximate nonlinear equations were obtained and used to correct an error in the earlier paper. These equations can be used for calculations in the drift region of a klystron. It is shown that this approximate method gives

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S/141/62/005/001/023/024
E039/E485

Method of approximation ...

slightly higher values for F (a dimensionless complex HF field amplitude) than the more exact calculation. It is concluded that the approximate method is always suitable for qualitative estimates. There is 1 figure.

ASSOCIATION: Institut radiotekhnicheskikh problem AN UkrSSR (Institute of Radioengineering Problems AS UkrSSR)

SUBMITTED: July 10, 1961

Card 2/2

44344

S/142/62/005/006/006/011
E192/E382

94221

AUTHORS: Rapoport, G.K. and Zhurakhovskiy, V.A.

TITLE: Theory of phasochronous devices of type "O" with helical electron beams

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, v. 5, no. 6, 1962, 707 - 713

TEXT: The helical electron beam is controlled by a constant magnetic field $B_z = B_0$ and moves in a high-frequency field described by:

$$\left.\begin{aligned} \vec{E}_{\pm s} &= \vec{E}_{\pm s} A e^{i(\omega t \mp \Gamma z)} \\ \vec{H}_{\pm s} &= \vec{H}_{\pm s} A e^{i(\omega t \mp \Gamma z)} \end{aligned}\right\} \qquad (1) .$$

The waves of the field propagate in a uniform cylindrical waveguide in the direction $\pm z$. Γ is the "hot" propagation constant and γ is a propagation constant in the absence of an electron beam. The axis of the helix z is parallel to the axis of the waveguide.

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The motion of the electrons in the presence of the field is described by:

$$\left.\begin{aligned}\dot{v}_x &= -\eta E_x + \eta v_z B_y - \eta v_y (B_z + B_o)\\ \dot{v}_y &= -\eta E_y + \eta v_x (B_z + B_o) - \eta v_z B_x\end{aligned}\right\} \quad (4a)$$

$$\dot{v}_z = -\eta E_z + \eta v_y B_x - \eta v_x B_y \quad (45) .$$

The solutions of Eqs. (4a) are in the form:

$$x = \tilde{X}(z, \alpha) + x_1(z, \alpha)$$

$$y = \tilde{Y}(z, \alpha) + y_1(z, \alpha)$$

where:

$$\tilde{X}(z, \alpha) = X(t(t_o, z), t_o) .$$

The magnitudes for the alternating components $\tilde{X}$ and $\tilde{Y}$ produced by the different transit times of the electrons are much higher

S/142/62/005/006/006/011
E192/E382

Theory of phasochronous devices ....

than the components x_1 and y_1 ; the latter can therefore be neglected. An equation for the starting current of the system is derived and it is shown that this is similar to the small signal scattering equation of a travelling-wave tube or a backward-wave tube. If the spread of the electron velocities $\Delta v_z = \vartheta$ is taken into account, the scattering equation becomes:

$$(\varkappa + ib)(\varkappa^2 + 4QC) - i = 0 \qquad (22)$$

where

$$(\vartheta / 2Cv_{oz})^2 \equiv 4QC \qquad (21)$$

The following notation is adopted in Eq. (21):

$$\left.\begin{aligned} \varepsilon/C &\equiv b \\ \delta/C &\equiv \mu \\ \mu - ib &\equiv \varkappa \end{aligned}\right\} \qquad (17)$$

where ε is the detuning parameter. Eq. (22) is similar to that

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Theory of phasochronous devices S/142/62/005/006/006/011
E192/E382

of a travelling-wave tube with space charge. The effect of the variations in the magnetic field is also taken into account and it is found that 1% variation can lead to the doubling of the starting current.

ASSOCIATION: Institut radiotekhnicheskikh problem AN USSR
(Institute of Radio-engineering Problems, AS UkrSSR)

SUBMITTED: April 10, 1962 (initially)
May 14, 1962 (after revision)

Card 4/4

S/109/62/007/002/019/024
D201/D303

AUTHORS: Kasatkin, L.V., and Rapoport, G.N.

TITLE: On the problem of choice of beyond-the-cut-off systems for amplification of space-charge waves

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 2, 1962, 347 - 348

TEXT: The authors show that the derivative of the radial inductive
susceptance $Y = -jB\ |\partial Y/\partial\omega|$ is inversely proportional to the pa-
rameter E_z^2/W, where E_z - the intensity of the longitudinal electric
field at the stream boundary; W - the stored electromagnetic energy
per unit length of the system. It follows that in order to obtain
an insignificant frequency dependence of the inductive susceptance
at the electron stream boundary and to improve the amplification
frequency characteristics, systems should be chosen which, for a
given longitudinal electric field, have the least amount of stored
energy. There are 2 non-Soviet-bloc references. The reference to

Card 1/2

S/109/62/007/002/019/024
On the problem of choice of ... D201/D303

the English-language publication reads as follows: C.R. Birdsall, J.R. Whinery, Waves in an electron stream with general admittance walls, J. Appl. Phys., 1953, 24, 3, 314.

SUBMITTED: April 28, 1961

Card 2/2

35469
S/109/62/007/003/012/029
D266/D302

9,4231 (1532, 3304)

AUTHORS: Rapoport, G.N., and Nazaruchuk, A.T.

TITLE: The influence of phase velocity gradient on the condition of self-excitation of backward wave oscillators

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 3, 1962, 460 - 463

TEXT: The purpose of the paper is to determine analytically the effect of phase velocity change (increase or decrease) on the starting conditions of backward wave oscillation. This problem mainly arises at travelling wave tubes where undesirable oscillations are to be suppressed. L.P. Lisovskiy's experiments (Ref.*2: Radiotekhnika i elektronika 1960, 5, 9, 1442), however, showed unambiguously that the starting current always increases independently of the sign of phase velocity change. The present paper gives an analytical confirmation of these experiments. The calculations are based on the following assumptions: 1) The slow wave structure is lossless; 2) The effect of space-charge is negligible; 3) In spite of

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*S/109/60/005/009/010/026

S/109/62/007/003/012/029
D266/D302

The influence of phase velocity ...

a change in phase velocity the impedance of the backward wave remains constant. The a.c. current in this case can be obtained from the differential equation

$$\frac{d^3\Psi}{dx^3} + ib\frac{d^2\Psi}{dx^2} - i\Psi = 0, \qquad (1)$$

where $x = (\omega/v_0)Cs$; ω - frequency, v_0 - initial velocity of electrons, s - longitudinal coordinate, C - gain parameter, and $\Psi(x)$ is related to the amplitude of the a.c. current by the formula

$$I_{\sim} = -iI_0\Psi e^{-i\frac{\omega}{v_0}s},$$

where I_0 - d.c. current; b in Eq. (1) depends on the axial coordinate in the following manner

$$b(x) = \frac{v_0 - u}{Cu(x)}$$

where u(x) is the phase velocity. Assuming now a linear variation in b(x)
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S/109/62/007/003/012/029
D266/D302

The influence of phase velocity ...

$$b(x) = b_0 + \mu x \qquad (5)$$

$$\mu = \frac{1}{C^2}\varkappa ; \quad \varkappa = \frac{v_0}{u_0}\frac{d(u_0/u)}{d\,\Phi} \simeq -\frac{1}{2\pi}\frac{d(u_0/u)}{dN} ; \qquad (6)$$

and $\Phi = \omega s/v_0$. Positive values of μ correspond to a decrease of phase velocity in the direction of electron motion. $\mu^* = 2.8$ represents a critical value, if $/\mu/ > \mu^*$ there is no solution, i.e. however long the interaction region no osillation is possible. Positive and negative values of u give essentially identical results. $K = I_s/I_{so}$ is plotted against σ where I_s starting current, I_{so} - starting current for constant phase velocity and

$$\sigma = \varkappa\left(\frac{N}{0.314}\right)^2. \qquad (11)$$

There are 2 figures and 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: D.V. Geppert, Proc. IRE, 1958, 46, 9, 1658; E. Nalos, Microwave, J., 1960, 1, 46.

SUBMITTED: June 16, 1961

Card 3/3

S/109/62/007/003/013/029
D266/D302

9.4231 (1532, 1144)

AUTHOR: Rapoport, G.N.

TITLE: Efficiency of a backward wave oscillator when the phase velocity decreases along the slow wave structure

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 3, 1962, 464 - 467

TEXT: The purpose of the paper is to compare numerically the efficiency of a homogeneous BWO (phase velocity along slow wave structure constant) with that of an inhomogeneous BWO (phase velocity decreasing). The work is a generalization of two previous papers of the author, one concerned with the effect of inhomogeneity and the other with large signal calculations of efficiency. Assuming negligible space-charge and attenuation the numerical calculations were performed on an electronic computer in the approximation of 16 electrons per period. The normalized efficiency $\bar{p} = P/CI_0U_0$ (I_0, U_0 - d.c. current and voltage, P - output power, C - Pierce's gain parameter) is plotted against $2\pi CN$ where N is the number of wavelengths

X

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Efficiency of a backward wave ...

S/109/62/007/003/015/029
D266/D302

in the interaction region. For $2\pi CN \cong 2.8$ where the efficiency of the homogeneous BWO is maximum, the efficiency of the inhomogeneous BWO is smaller. At a larger value of $2\pi CN$ the inhomogeneous BWO gives the better result. This is not a higher mode of oscillation; the increase in efficiency is due to an improved distribution of electric intensity in the interaction region. In the inhomogeneous case the electric intensity falls more gradually which appears to ensure a higher efficiency. There are 5 figures and 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc.

SUBMITTED: July 7, 1961

Card 2/2

S/109/62/007/008/016/015
D409/D301

9.4231

AUTHORS: Rapoport, G.N. and Denisov, A.I.

TITLE: A two-cascade backward-wave amplifier in the case of strong signals

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 8, 1962, 1361-1366

TEXT: The results are given of numerical calculations of strong signal amplification in a two-cascade backward-wave amplifier. A comparison with a single-cascade amplifier is made. The numerical integration of the nonlinear equations was performed on the electronic computer "Kiyev". The phases and velocities of the electrons which passed through the first cascade, were stored in the computer memory and used as initial data for calculating the second cascade. This amounted to determination of the dependence of the cascade-length x_3 on the output amplitude δ_2. It was necessary to perform a series of trial calculations, followed by interpolation. Owing to the great volume of calculations, the effect of the space charge was

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S/109/62/007/008/010/015
D409/D301

A two-cascade backward-wave ...

neglected and other simplifying assumptions were made. The results show that the first cascade operates in an almost linear regime. A figure shows the dependence of the total gain G of the amplifier on the velocity parameter $\bar{b}$. It was found that in the case of strong signals, the gain and bandwidth change little if the ratio I/I_{st2} (operating current to starting current) varies from 0.53 to 0.96. From another diagram it is evident that with $I/I_{st2} = 0.8$, the saturation power of the amplifier is 2CIV approximately (C being the gain parameter and V the accelerating voltage); this is more than the maximum power of an oscillator for the same parameter-values. The nonlinear effects in the case of a strong signal, are to a large extent analogous in one-cascade and two-cascade amplifiers. A comparison of results shows that the two-cascade amplifier gives higher gain than the one-cascade amplifier; this applies to both strong and weak signals. On the other hand, power saturation at the output is more pronounced in the two-cascade amplifier. In order to provide greater band-width, it is convenient to make the first cascade shorter than the second. Under near-saturation conditions,

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S/109/62/007/008/010/015
D409/D301

A two-cascade backward-wave ...

stability is preserved even in the I_{st}-region. Transition from the amplifying to the synchronization regime is not accompanied by a sharp change in output power. There are 7 figures.

SUBMITTED: October 9, 1961

4

Card 3/3

RAPOPORT, G.N.

Concerning the theory of an isochronous traveling-wave tube. Radiotekh. i elektron. 7 no.8:1457-1458 Ag '62. (MIRA 15:8)
(Traveling-wave tubes)

L 12812-63 EWT(1)/BDS/EEC(b)-2 AFFTC/ASD/ESD-3/RADC Pi-4/Pj-4
S/109/63/008/004/006/030

65

AUTHORS: Rapoport, G. N., and Dobrovinskiy, V. R.

TITLE: On the question of computing the coefficient of depression

PERIODICAL: Radiotekhnika i elektronika, v. 8, no. 4, 1963, 585-590

TEXT: Determining the parameters of the charge in the linear theory of a TW tube involves computation of the coefficient of depression Γ. Of the various methods described in the literature for determining this coefficient, of greatest significance is the method used by L. A. Vaynshteyn (in the Journal of Theoretical Physics, 1956, v. 26, no. 1, 141), and the methods of L. N. Loshakov and Yu. N. Pchelnikov (described in Radiotekhnika i elektronika, v. 4, no. 9, 1959, 1493; and no. 10, 1670). The article demonstrates the equivalence of the above methods in case of TW tubes with an axially symmetrical delaying system, as well as in the case of TW tubes with a spirally conducting cylinder—given a sufficiently small electron beam current.

SUBMITTED: April 16, 1962

Card 1/1

L 17753-63 EWT(1)/BDS AFFTC/ASD

ACCESSION NR: AP3006461 S/0109/63/008/009/1577/1586

52

AUTHOR: Kasatkin, L. V.; Rapoport, G. N.

TITLE: Effect of mismatch on the characteristics of the O-type backward-wave oscillator 25B

SOURCE: Radiotekhnika i elektronika, v. 8, no. 9, 1963, 1577-1586

TOPIC TAGS: backward wave oscillator, carcinotron, backward wave oscillator mismatch, carcinotron linear condition, carcinotron nonlinear condition, carcinotron initial current variation, carcinotron electric retuning

ABSTRACT: Through the use of the disturbance method a general analysis of the effect of a small mismatch on the characteristics of a backward-wave oscillator is presented for both linear and nonlinear operating conditions. An examination of the starting characteristics of the device with a fixed length of the delay system shows that the mismatch leads to variations in starting current, self-excitation frequency, and output power. Under FM

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L 17753-63

ACCESSION NR: AP3006461 0

operation the mismatch leads to unequal energy distribution in the radiated spectrum. It is also shown that the long-line effect is inherent in the oscillator and that the value of a critical reflection coefficient corresponding to the frequency jumps in the retuning range depends on delay system characteristics as well as on the distance between the mismatch and the oscillator. Under actual operating conditions an increase in space charge parameters leads to an increase in variations of electronic retuning characteristics and a decrease in the critical reflection coefficient. Power and frequency variations of oscillations under finite amplitude conditions were determined on the basis of a numerical solution of nonlinear equations for backward-wave tubes. Orig. art. has: 23 formulas, 8 figures, and 2 tables.

ASSOCIATION: none

SUBMITTED: 07Jul62	DATE ACQ: 30Sep63	ENCL: 00
SUB CODE: SD	NO REF SOV: 001	OTHER: 003

Card 2/2

RAPOPORT, G.N.; ANDRUSHKO, L.M.

Theory of matching regular and septate waveguides. Izv. vys. ucheb. zav.; radiotekh. 7 no.2:250-253 Mr-Ap '64. (MIRA 17:8)

ACCESSION NR: AP4009983 S/0109/64/009/001/0118/0125

AUTHOR: Rapoport, G. N.

TITLE: Approximate analysis of synchronizing self-oscillations of a type-O backward-wave tube by a weak signal

SOURCE: Radiotekhnika i elektronika, v. 9, no. 1, 1964, 118-125

TOPIC TAGS: electron tube, backward wave tube, type O backward wave tube, backward wave tube locking, weak signal locking, backward wave tube synchronization, frequency pulling

ABSTRACT: A general phenomenological method of plotting amplitude-frequency characteristics of the synchronization of quasi-harmonic oscillators by a weak signal which is treated as a small disturbance is considered. A numerical solution of the nonlinear equations of a backward-wave tube is used to calculate the above characteristics. The limits of the locking band are identified as points

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ACCESSION NR: AP4009983

of return of the amplitude-frequency characteristic. The locking bandwidth is evaluated by the results of (a) the nonlinear theory and (b) the linear theory of a backward-wave tube. Phenomena of frequency pulling (synchronization hysteresis) at the band edges are also briefly discussed. Orig. art. has: 2 figures and 16 formulas.

ASSOCIATION: none

SUBMITTED: 22Nov62 DATE ACQ: 10Feb64 ENCL: 00

SUB CODE: GE NO REF SOV: 006 OTHER: 004

Card 2/2

ACCESSION NR: AP4024729 S/0109/64/009/003/0483/0504

AUTHOR: Rapoport, G. N.

TITLE: Nonlinear theory of the O-type backward-wave oscillator with a periodic delay structure

SOURCE: Radiotekhnika i elektronika, v. 9, no. 3, 1964, 483-504

TOPIC TAGS: oscillator, backwardwave oscillator, O type backwardwave oscillator, periodic delay structure, backwardwave oscillator theory

ABSTRACT: The article consists of two parts: In the first part, the nonlinear equations describing a backward-wave tube with a periodic delay structure are given; they allow for higher spatial harmonics of the field, for an "oncoming wave," and for relativistic effects; they have this form:

$$z''(\alpha, x) = -[1 + C(b - z')]^3 \left\{ \mathrm{Re}\left[\left(F_{10} + i\frac{C\Theta}{1 + Cb} f_1\right) e^{-iz(\alpha, x)}\right] + \right.$$

$$\left. + 4QC\frac{1}{\pi\psi}\int_0^{2\pi} \Phi[z(\alpha', x) - z(\alpha, x)]\, d\alpha' \right\}. \qquad (32)$$

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ACCESSION NR: AP4024729

Various methods of approximating the space-charge field in a cylindrical electron beam are considered. In the second part of the article, the results of numerical computations are reported. Most calculations allowed for 32 electron disks per period with 4QC ≠ 0 and 16 disks with 4QC = 0. Mistakes in the "calculation program" by J. E. Rowe ("Analysis of Nonlinear O-type Backward-Wave Oscillators," Polytechn. Inst. of Brooklyn, April 8-10, 1958) are claimed to have been found. Correction of the space-charge parameter, relativistic effects, optimum length of the interaction space, and losses in and efficiency of the backward-wave tube are discussed in some detail in the "Conclusion." "The author wishes to thank the management and the workers of the Computing Centers, AN SSSR and AN UkrSSR, and also A. T. Nazarchuk and A. K. Nemak who ensured the programing and carrying out of numerical calculations on digital computers." Orig. art. has: 14 figures, 60 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 10Apr64

ENCL: 00

SUB CODE: EC

NO REF SOV: 007

OTHER: 010

Cord 2/2

RAPOPORT, G.N.; BONDARENKO, R.N.; GLADYSHEV, G.I.

Clarification of a formula for determining the specific inductive capacitance of samples using a resonance frequency shifting technique. Radiotekh. i elektron. 9 no.7:1319-1320 Jl '64 (MIRA 17:8)

ACCESSION NR: AP4043689 S/0109/64/009/008/1520/1522

AUTHOR: Rapoport, G. N.; Klushin, A. A.

TITLE: Evaluating the locking-in bandwidth in a backward-wave oscillator synchronized by a modulated electron beam

SOURCE: Radiotekhnika i elektronika, v. 9, no. 8, 1964, 1520 - 1522

TOPIC TAGS: oscillator, backward wave oscillator, synchronized backward wave oscillator

ABSTRACT: Based on E. A. Asch's (Proc. IEE, 1958, 105, pt.B, 10, 588) and H. R. Johnson's (Proc. IRE, 1955, 3, 4, 684) theory of weak-signal synchronization, formulas are developed for evaluating the lock-in bandwidth. The modulation is performed by the synchronizing stage which operates as a lower-than-starting-current backward-wave amplifier. It is shown that, for a given lock-in bandwidth, the effective gain of a 2-stage circuit is 10-15 db higher than that of a BWO synchronized by a signal applied to the collector end of the delay system. Orig. art. has: 3 figures and 8 formulas.

Card 1/2

ACCESSION NR: AP4043689

ASSOCIATION: none

SUBMITTED: 27Jun63 ENCL: 00

SUB CODE: EC NO REF SOV: 003 OTHER: 003

Card 2/2

ACC NR: AT6022260 SOURCE CODE: UR/0000/66/000/000/0088/0094

AUTHOR: Rapoport, G. N.; Zhurakovskiy, V. A.

ORG: none

TITLE: Interaction of helical electron beams with standing waves in a large space

SOURCE: Vsesoyuznaya nauchnaya sessiya, posvyashchennaya Dnyu radio. 22d, 1966. Sektsiya elektroniki. Doklady. Moscow, 1966, 88-94

TOPIC TAGS: SHF tube, electron interaction, electron beam

ABSTRACT: To lower the required magnetic-field strength in a SHF helical-beam smooth-resonator tube, operation at an approximate resonance of the signal frequency and a higher n-th harmonic of the electron cyclotron frequency has been suggested. The present article investigates the nonlinear interaction between the electrons in a low-density uniform helical beam and an electromagnetic field

Card 1/2

ACC NR: AT6022260

harmonically varying through the beam section; the interaction zone is situated inside the resonator. By solving a system of drift equations on a digital computer, optimal tube parameters (ensuring maximum oscillator efficiency) are found, and curves of efficiency η_1 vs. field parameter ϑ^{-1} are plotted. The final set of curves shows η_1 vs. I_o/I_{st}, where I_o and I_{st} are working and starting currents, respectively. These curves are intended to help in designing helical-beam SHF oscillators. Orig. art. has: 3 figures and 14 formulas.

SUB CODE: 09, 20 / SUBM DATE: 09Apr66 / ORIG REF: 001 / OTH REF: 002

Production of alumina from clay. G. S. Rapoport. *Bumazhnaya Prom.* 14, No. 1, 70-3(1935).—A description with illustration.
Chas. Blanc

YANAT'YEVA, O.K.; RAPOPORT, G.S.; RASSONSKAYA. I.S.; USTINOVA, M.B.

Physicochemical investigations of calcium and magnesium carbonates appropriate to the conditions of sovelit production. Zhur.prikl. khim. 34 no.10:2347-2350 O '61. (MIRA 14:11)

1. Insitut obshchey i neorganicheskoy khimii imeni N.S.Kurnakova AN SSSR.

(Sovelit) (Calcium carbonate) (Magnesium carbonate)

MERZLYAK, A.N., inzh.; RAPOPORT, G.S., inzh.; FEDORENKO, V.S., inzh.

Using fireproof gypsum-perlite plasters. Mont.i spets.rab.v stroi. 22 no.4:24-25 Ap '60. (MIRA 13:8)

1. Institut teploproyekt i TSentral'nyy nauchno-issledovatel'skiy institut protivopozharnoy oborony.
(Plaster) (Building, Fireproof)

PROCESSES AND PROPERTIES INDEX

Cr

18

Solvents in the preparation of copper sulfate by the tower process. G. S. Rapoport. *J. Chem. Ind.* (Moscow) 12, 395-7(1935).—The work of a $CuSO_4$ factory is analyzed, and suggestions are made for improving the process.

H. M. Leicester

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

RAPOPORT, I. A.

"The Effect Of [illegible] On Non-Disjunction Of The Fourth And X-Chromosomes In Drosophila Mel-anogaster. [illegible] And The Department Of Genetics, Institute Of Experimental Biology, Moscow." (61) by Rapoport, I. A.

SO: [illegible] OF JOURNAL OF GENERAL BIOLOGY. (Biologicheskii Zhurnal) Vol. VII, 1938

RAPOPORT, I. A.

"Specific morphoses in Drosophila induced by chemical compounds," Bull biol med exptl, URSS 7, 415-17 (1939) [illegible], I. A.

"Multiple Linear Repetitions of Chromosome Blocks and Their Evolutionary Significance."
(p. 235) by Rapoport, I. A.

SO: Journal of General Biology, (Zhurnal Obshchey Biologii), 1940, Vol. I, No. 2

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

Ca

11 I

Effect of thymonucleic and nucleic acids and of some of their components on mutations. I. A. Rapoport. *Compt. rend. acad. sci. U. R. S. S.* **27,** 1001-4(1940)(in English). To exam. the effect of specific chem. stimulators on mutations, nucleic and thymonucleic acids, their sodium salts, uracil, Me-uracil and guanine were introduced into the food of fruit flies (sublethal concns. of reagents). No effects on mutations were observed. A. H. Krappe

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

MATERIALS INDEX

AUTHOR INDEX

3RD AND 4TH ORDERS

1ST AND 2ND LETTER

RAPOPORT, I. A.

"On Substances which Disturb the Symmetry in the Organism," Dok. AN 27, Nos. 4, 3, 1940.

RAPOPORT, I. A.

"Interaction of Genes in Various Quantitative Combinations," Dok. AN 27, Nos. 4, 9, 1940.

RAPOPORT, I. A.

"Peculiarities of the Dominant Mutations Barred and Hairy Wing," Dok. AN 29, No 8-9, 1940.

Inst. of Experimental Biology, AS

RAPOPORT, I. A.

"Proof of Chromosome Fragmentation," Dok. AN 29, No 3-4, 1940.

Inst. of Experimental Biology, AS

RAPOPORT, I. A.

"A Phenogenetic analysis of Discreteness," (p. 431) by I. A. Rapoport.

SO: Journal of General Biology (Zhurnal Obschei Biologii) Volume II No. 3, 1941.

11A

Oxidation and the mechanism of action of mutational factors. I. A. Rapoport. *J. Gen. Biol.* (U. S. S. R.) 4, 65-72(1943).—On the basis of expts. involving the use of x-rays in conjunction with heavy metals (as substances which amplify the physiol. action of allotropic forms of O), R. concludes that ozone is the chem. mediator of the action of x-rays. Rupture of chromosome chains by short-wave energy is likened to the rupture of ozonides at the points of unsatn. Synapsis and crossing over are explained as labile polymerization and depolymerization with regrouping of the unsatn. points in chromosomes. Active forms of metabolic O may be of importance in this connection. G. M. Kosolapoff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

RAPOPORT, I. A.

"Phaenogenetics of the Eye Structure in Insects." (p. 659) by Rapoport, I. A. (Moscow)

SC: Advances in Modern Biology (Uspekhi Sovremennoi Biologii) Vol. 16, No. 6, 1943.

[illegible], I. A.

"Polyploidy in Animals Induced by Colchicine Treatment of Gonad Rudiments," Dok. AN, 53, No 1, 1946.

Inst. of Cytology, Histology and Embryology, AS.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

C 4

11 2

Carbonyl compounds and the chemical mechanism of mutations. I. A. Rapoport. *Compt. rend. acad. sci. U.R.S.S.* 54, 65-7(1946)(in English). Studies with the larvae of *Drosophila* showed that of many chem. substances tested, only aldehydes and ketones are able, on a large scale, to induce mutations similar to the known types of mutation. Phenocopies of tumor mutations were readily produced by means of aldehydes and ketones such as nitrobenzaldehyde, cyclopentanone, cyclohexanone, diphenyl ketene, and Michler's ketone. In other expts. high mutation activity was shown by urotropine, HCHO, and paraformaldehyde. These results indicated that certain carbonyl compds. acted to produce mutations in amts. equal to that produced by short-wave energy.

J. E. Webster

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

11a

Chemical reaction with the protein amino groups in gene structure. I. A. Rapoport (Acad. Sci., Moscow). *J. Gen. Biol.* (U.S.S.R.) 8, 359-70(1947).—A review of chem. induction of mutations is given with many references. *Drosophila melanogaster* adults, larvae, and eggs were subjected to the action of low concn. of formaldehyde and the mutations thus produced were studied. Introduction of sublethal concn. of CH_2O into the feed of adults for 10 15 days failed to increase the mutation frequency in the progeny. Successful results, however, were observed when 1:150, or less, concn. of CH_2O was maintained in the nutrient medium with 1 24 hr. larvae or 15 24-hr. eggs. Here the larval period is increased 2-3-fold, and at higher concns. even up to 25 days; the larvae and the pupae are smaller in size than normal. Although the larvae can survive fairly high concns. of CH_2O they do not form pupae until normal nutrient medium is introduced; at high concn. this ability may be entirely lost, i.e., CH_2O tends to extend infantilism. Larvae can hatch from eggs kept 2-3 hrs. in 1:25 CH_2O. Since the mutations induced in the early stage of gametogenesis may duplicate themselves in a complex manner, no work was done on eggs until 15 hrs. after laying. The expts. were run on 2 series of the insects: an inbred wild type and a type in which a second inversion was induced by x-rays. CH_2O at 0.5-0.75% produces 5-6% lethals, with considerably increased duration of larval state. The use of 1:50 CH_2O for 1 hr. on the eggs gave 2.3% mutants; 1:25 gave 5.6% mutants. Almost all medicinals capable of giving off CH_2O cause lethal mutations; higher aldehydes do not have appreciable activity. The time of death in the lethals is distributed throughout the metamorphosis. Fertility is not affected nor is there an increase of dominant lethals (which are characteristic in x-ray mutations). Chromosome rupture (fragmentation) does not take place, as shown by the study of the sex-linked chromosomes. Neither was the deficiency of individual genes observed. It appears that CH_2O has an unusual capacity to produce mutations by affecting specific components of the genes (called L component by R.), without affecting the other parts of gene structure. The hypothesis advanced for this action is that of formol-type blocking of the NH_2 groups of the gene protein, with an essentially unimol. process, as shown by the mutation frequency-CH_2O concn. curve. The reaction of genes with CH_2O appears to show the former to act as independent mol. units, excluding the possibilities of sub genes or the existence of a chromosome as a unified mol. structure.

G. M. Kosolapoff

ASO-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

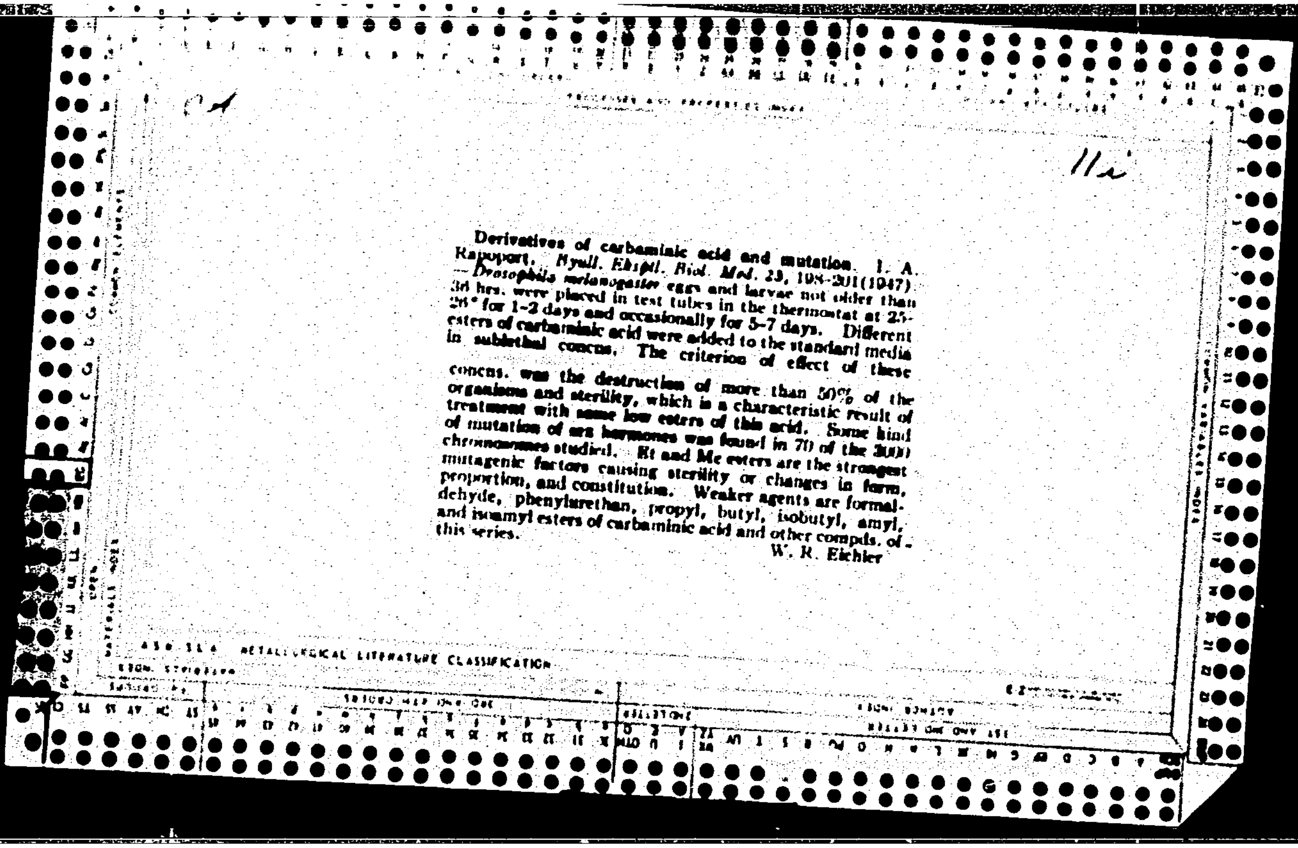
CA

11 A

Inheritance changes taking place under the influence of diethyl sulfate and dimethyl sulfate. I. A. Rapoport. *Doklady Vsesoyuz. Akad. Sel'sko-Khoz. Nauk im. V. I. Lenina* **12**, No. 10, 12-15(1947).—Because of its low soly., the Et_2SO_4 was placed on the surface of the nutrient medium in the form of an emulsion. Eggs and larvae of yellow 3P *Drosophila melanogaster*, 10 to 30 hrs. old, were used. Each test tube had 100-150 eggs and larvae of which 5 to 15 flies appeared when the Et_2SO_4 reached a sublethal concn. In the progeny of each male, 10 to 15 chromosomes were studied. The results show that in the exptl. tubes the no. of chromosomes was 911 against 781 in the control, the no. of mutations 22 and 1, resp.

I. S. Joffe

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



C4

11a

PROCESSES AND PROPERTIES INDEX

Derivatives of carbaminic acid and mutation. I. A. Rapoport. *Byull. Eksptl. Biol. Med.* 23, 198-201(1947). —*Drosophila melanogaster* eggs and larvae not older than 3d hrs. were placed in test tubes in the thermostat at 25-26° for 1-2 days and occasionally for 5-7 days. Different esters of carbaminic acid were added to the standard media in sublethal concns. The criterion of effect of these

concns. was the destruction of more than 50% of the organisms and sterility, which is a characteristic result of treatment with some low esters of this acid. Some kind of mutation of sex hormones was found in 70 of the 3000 chromosomes studied. Et and Me esters are the strongest mutagenic factors causing sterility or changes in form, proportion, and constitution. Weaker agents are formaldehyde, phenylurethan, propyl, butyl, isobutyl, amyl, and isoamyl esters of carbaminic acid and other compds. of this series.

W. R. Eichler

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

RAPOPORT, I. A.

Mbr., Institute of Cytology, Histology, and Embryology, Acad. Sci. 1947

"Reaction of Free Amino Groups in Gene Proteins," Dok. AN, 56, No. 5, 1947

CA

11 I

Acetylation of gene proteins and mutations. I. A. Rapoport. *Doklady Akad. Nauk S.S.S.R.* 58, 119-22(1947).—The Florida strain of *Drosophila melanogaster* was treated with ketene. Highest onset of mutations was observed when the fertilized eggs (3-15 hrs.) were placed in H_2O through which ketene was bubbled (3 hrs. at 0.07-0.2 mole per hr.); about 1.5% mutations were observed as shown by the appearance of dark spots on the cuticle, similar to those caused by CH_2O. The effect was noted even after 15 min. exposure. No increase in mutations was observed in tests with adult insects since ketene is rapidly insecticidal; pupae were more resistant. Treatment of eggs on agar with a ketene atm. for 20-40 min. gave several lethal mutations; diketene in Et_2O produced some 2% mutations. Diphenyl ketene in aq. soln. gave neg. results. The effects of ketene on gene proteins are discussed in the light of possible action by acetylation of amino groups. G. M. Kosolapoff

Inst. Cytology, Histology + Embryology, AS USSR

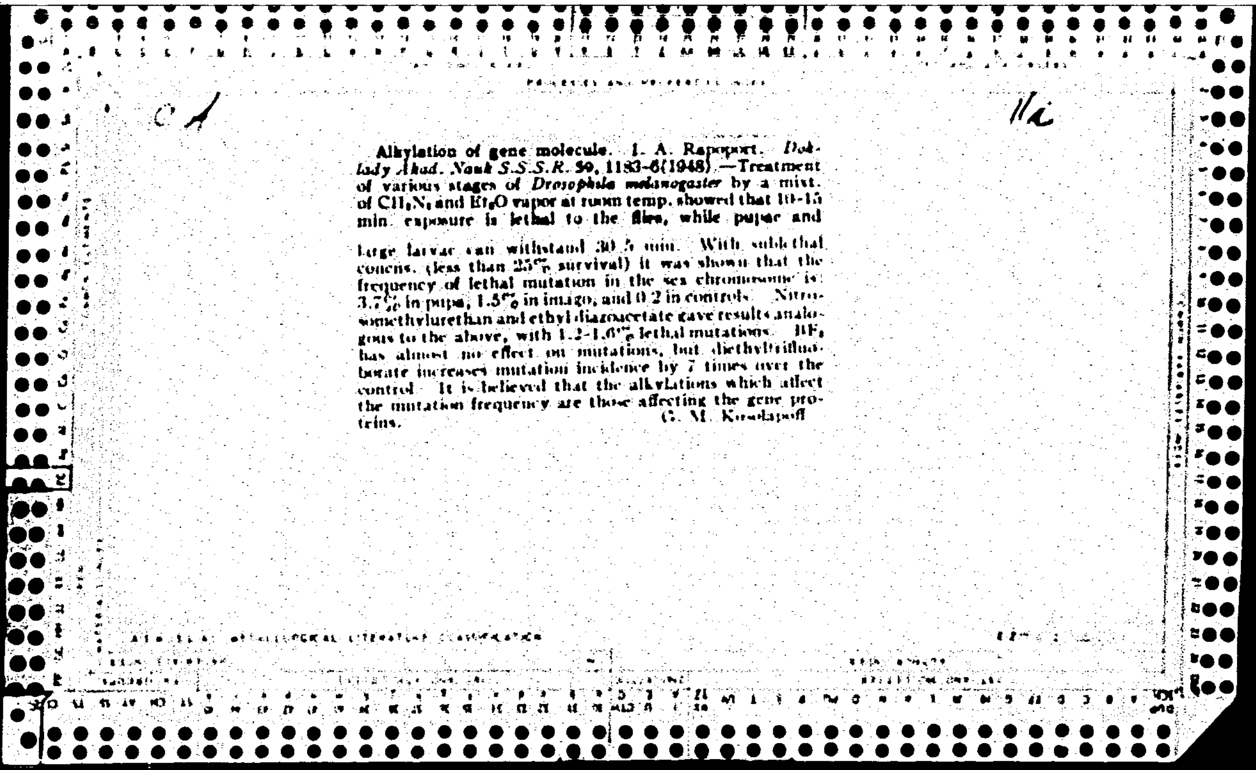
CA

11 I

Optically active substances and symmetry of an organism. I. A. Rapoport. *Doklady Akad. Nauk S.S.S.R.* 58, 1167-70 (1947).—Studies were made of allelomorphs of mutations showing right- and left-handed asymmetry in *Drosophila melanogaster.* Left-hand asymmetry of a noninheritable nature develops in individuals treated with hydroquinone, *p*-benzoquinone or *p*-aminophenol; *p*-phenylenediamine causes right-handed asymmetry. Ortho- and meta-substituted analogs cause no changes. Application of *d*- and *l*-forms of the common alkaloids of isoquinoline series was without effect. Emetine and cepheline gave right-handed asymmetry, while bulbocapnine gave left-asymmetry.
G. M. Kosolapoff

RAPOPORT, I. A.

"Synthesis of gene-products in equimolar quantities," Am Naturalist, 81, 30-7 (1947)



PROCESSES AND PROPERTIES INDEX

C 1 11c

Alkylation of gene molecule. I. A. Rapoport. *Doklady Akad. Nauk S.S.S.R.* **59**, 1183-6(1948).—Treatment of various stages of *Drosophila melanogaster* by a mixt. of CH_2N_2 and Et_2O vapor at room temp. showed that 10-15 min. exposure is lethal to the flies, while pupae and large larvae can withstand 30.5 min. With sublethal concns. (less than 25% survival) it was shown that the frequency of lethal mutation in the sex chromosome is: 3.7% in pupa, 1.5% in imago, and 0.2 in controls. Nitrosomethylurethan and ethyl diazoacetate gave results analogous to the above, with 1.2-1.6% lethal mutations. BF_3 has almost no effect on mutations, but diethyltrifluoborate increases mutation incidence by 7 times over the control. It is believed that the alkylations which affect the mutation frequency are those affecting the gene proteins. G. M. Kosolapoff

METALLURGICAL LITERATURE CLASSIFICATION

RAPOPORT, I. A. PA-77T11

USSR/Chemistry - Ethylene, Oxide of Apr 1948
Medicine - Heredity, Mechanisms

"The Action of Oxides of Ethylene, Glycide and Glycols on the Mutation Gene," I. A. Rapoport, Inst Cytology, Histology and Embryol, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LX, No 3

Genetic analyses of mutation activity of oxides of ethylene permit data to be obtained on internal mechanisms of gene mutations. Submitted by Acad L. A. Orbeli 16 Feb 1948.

77T11

PROCESSES AND PROPERTIES INDEX

CA

11I

Mutations under the influence of unsaturated aldehydes. I. A. Rapoport. *Doklady Akad. Nauk S.S.S.R.* 61, 713-15(1948).—As shown earlier (C.A. 41, 3514c) aldehydes behave similarly to other compds. in that the 1st 2 members exhibit the highest production of mutations; increase up the homologous series leads to a sharp drop in activity. Tests on acrolein, crotonaldehyde, citral, citronellal, hydroxycitronellal, and propargyl aldehyde, showed that *Drosophila melanogaster* eggs or young larvae treated with emulsions of these aldehydes gave at least [illegible] fatalities (propargyl aldehyde was unexpectedly least toxic), while survivors gave the following percentage mutations: 2.23, 0.44, 0.47, 1.8, 0.83, 1.32, resp., in the sex chromosomes. (Control 0.19%.) It is noticeable that the unsatd. aldehydes have much higher potency than the satd. members studied earlier and the activity extends considerably into the higher members. Thus acrolein is 10 times more active than AcH. G. M. Kosolapoff

Inst. Cytology, Histology, + Embryology, AS USSR

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

RAPOPORT, I.A.

Phenogenetics of the critical element of the malignant tumor. Biul.MOIP. Otd.biol. 61 no.5:13-30 S-O '56. (MLRA 10:2)

(CANCER)

RAPOPORT, I.A.

Phenogenetics of the critical link in malignant tumors [with summary in English]. Biul.MOIP.Otd.biol. 61 no.6:49-69 N-D '56. (MIRA 10:8)
(CANCER) (PHYSIOLOGICAL CHEMISTRY)

S/020/60/131/01/055/060
3011/B009

AUTHORS: Rapoport, I. A., Kostyanovskiy, R. G.

TITLE: The Mutation Activity of Some Inhibitors of Cholinesterase

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 1, pp 191 - 194 (USSR)

ABSTRACT: In the present paper the authors report on their experiments with the isopropyl ester of methylphosphinic acid fluoride (IMPhF). They succeeded in causing hereditary changes in the common fruit fly Drosophila melanogaster (24-48 hour-old larvae as well as full-grown flies) by means of this substance. The insects were exposed to IMPhF vapor after an equilibrium concentration of this substance had been reached in the vessel. In the first experiment series the concentration was 12 mg/l, in the second series 8.5 mg/l. The insects were exposed to the vapor for 3-25 minutes. In the second series a second treatment was carried out. The effect of IMPhF was analyzed with regard to the incidence of mutations according to sex. For this purpose the strain y^{3P} of the common fruit fly, which had been used in several earlier experiments, was used. The male insects of this strain were crossed with females of the strain Bcl/white. Table 1 gives the results. The comparison of the re-

Card 1/3

The Mutation Activity of Some Inhibitors of Cholinesterase

S/020/60/131/01/053/060
B011/B002

sulting lethal mutations with the incidence of spontaneous mutation in the sex chromosome (1 : 700 + 1 : 1000) shows that IMPhF is able to increase the incidence of hereditary shifts approximately to the hundredfold. Its effect probably surpasses that of short-wave irradiation. Thus this new transgenation factor is of great interest for industrial (antibiotics production) and agricultural selection. The authors go on to quote exclusively western biochemical papers (Refs 10-24) to cast light on some aspects of the mechanism of intervention of IMPhF into the autocatalysis. These data are of interest particularly in connection with the high cholinesterase content of the cell nuclei (Ref 10). All the data cited permit the assumption that a direct phosphorylation is responsible for the mutagenesis of the chromosome substrate, above all the protein part of the gene. Most probably the substances in question are the amino acids serine and tyrosine. This latter possibility may prove to be the source of a certain specificity of the mutagenic effect. There are 1 table and 24 references, 2 of which are Soviet.

Card 2/3

The Mutation Activity of Some Inhibitors of Cholinesterase

S/020/60/131/01/053/060
B011/B009

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: September 28, 1959, by N. N. Semenov, Academician

SUBMITTED: September 17, 1959

Card 3/3

RAPOPORT, I.A.

Reaction of factorial proteins with 1,2-dichloroethane. Dokl. AN SSSR 134 no.5:1214-1217 O '60. (MIRA 13:10)

1. Institut khimicheskoy fiziki Akademii nauk SSSR. Predstavleno akademikom N.N.Semenovym.
(Ethane) (Germ cells)

RAPOPORT, I.A.

Mutagenic effect of di-β,β'-chloroethylphosphorous acid. Dokl. AN SSSR 134 no.6:1447-1449 O '60. (MIRA 13:10)

1. Institut khimicheskoy fiziki Akademii nauk SSSR. Predstavleno akademikom N.N.Semenovym.
(Phosphorous acid) (Radiomimetic substances)

RAPOPORT, I. A. (USSR)

"Metabolites and Mutagenesis."

Report presented at the 5th International Biochemistry Congress, Moscow, 10-16 Aug 1961

RAPOPORT, I.A.

Fundamental differences in the reactive mechanism of modifications and mutations, particularly, the chemical ones. Biul. MOIP. Otd. biol. 66 no.2:135-152 Mr-Ap '61. (MIRA 14:6)
(CHEMICAL GENETICS)

RAPOPORT, I.A.

Chemical mutations in sex chromosomes with a frequency above 50 % and an increased fraction of semilethal genes. Dokl. AN SSSR 141 no.6:1476-1479 D '61. (MIRA 14:12)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom V.N.Sukachevym.

(Chromosomes) (Variation (Biology))
(Ethyl sulfate--Physiological effect)

RAPOPORT, I.A.; MILLER, A.V.

Mutagenic activity of antiparticles. Probl.kosm.biol. 2:359-369 '62. (MIRA 16:4)

(POSITRONS--PHYSIOLOGICAL EFFECT)
(VARIATION (BIOLOGY))

S/865/62/002/000/037/042
D405/D301

AUTHORS: Rapoport, I.A., Yarmonenko, S.P. and Avrunina, G.A.

TITLE: Effect of high-energy protons on frequency of mutations

SOURCE: Problemy kosmicheskoy biologii. v. 2. Ed. by N. Sisakyan and V. Yazdovskiy. Moscow, Izd-vo AN SSSR, 1962, 370-386

TEXT: The study of the effect of high-energy protons on the frequency of mutations is important owing to the fact that protons of energy up to 1000 Mev constitute a major component of cosmic radiation at a radius of 100-1000 km from the Earth's surface, this component being concentrated in particular in the regions of magnetic anomaly. The proton beam was obtained from the synchrocyclotron of the Joint Institute for Nuclear Research. The characteristic of the beam and the method of calculation are described in the references. Drosophila males of the line yellow^{39} were subjected to proton irradiation. Conclusions: Protons of energy 660 Mev in dose-rates of

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S/865/62/002/000/037/042
D405/D301

Effect of high-energy ...

510-12140 r bring about an increase in the frequency of recessive lethal mutations in Drosphila sex chromosomes that is proportional to the dose, constituting ~ 2% per each 1000 r. The curve mutation frequency vs. dose is very similar to the corresponding curve for gamma radiation. The measurement of the frequency of recessive lethal mutations for doses of 3980, 9165, 10745, 11485 and 12140 r during 6 experiments showed a sharp drop in the mutation yield of irradiated spermatogonia as compared to that of irradiated spermatozoids; the main reason for this is apparently the disproportionate rate of reduplication of gonial cells with chromosome abberations and semi-dominant and dominant lethals with respect to those left normal, and not the low mutability of spermatogonia. On comparing the fertility in the first generation of crossed males, it is found that the frequency of dominant lethal mutations in the irradiated spermatozoids has a similar pattern to that of dominant lethal mutations due to X- and gamma radiation. The curves for the frequency of sterility and semi-sterility mutations are similar to those for other mutations. The fact that the mutability curves retain their linearity when the oxygen concentration increases suggests that, in

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S/865/62/002/000/037/042
D405/D301

Effect of high-energy ...

the case of irradiation by high-energy protons, the oxygen is a more effective component of the mutation background than organic peroxides and radicals. There are 3 figures and 5 tables.

Card 3/3

RAPOPORT, I.A.; ZOZ, N.N.

Chemical mutation which do not affect the integrity of chromosomes.
TSitologiia 4 no.3:330-334 My-Je '62. (MIRA 16:3)

1. Otdel khimicheskikh i biologicheskikh protsessov Instituta
khimicheskoy fiziki AN SSSR, Moskva.
(VARIATION (BIOLOGY)) (CHROMOSOMES)

RAPOPORT, I.A.

Interaction of ethylenimine with gene proteins and hereditary variations. Biul. MOIP. Otd. biol. 67 no.1:96-114 Ja-F '62.
(MIRA 15:3)

(VARIATION (BIOLOGY))
(HEREDITY) (ETHYLENE)

RAPOPORT, I.A.

Effect of the dosage and stage of gametogenesis on ethylenimine-induced mutations. Biul.MOIP.Otd.biol. 67 no.4:109-123 Jl-Ag '62.
(MIRA 15:10)

(ETHYLENIMINE) (VARIATION (BIOLOGY))

RAPOPORT, I.A.

Effect of nitrosoethylurea producing 85% mutations in the sex chromosome. Dokl. AN SSSR 146 no.6:1418-1421 O '62. (MIRA 15:10)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom N.N. Semenovym.

(CHROMOSOMES) (UREA—PHYSIOLOGICAL EFFECT)

RAPOPORT, I. A.

Selective modificational sterility produced by dimethyl phosphate and other compounds. Dokl. AN SSSR 147 no.4:943-946 D '62. (MIRA 16:1)

1. Predstavleno akademikom N. N. Semenovym.

(Sterility) (Methyl phosphates)

RAPOPORT, I.A.

Precursors of amino acids as mutagens. Dokl. AN SSSR 147 no.5: 1193-1195 D '62. (MIRA 16:2)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom N.N. Semenovym.
(Variation (Biology)) (Amino acids)

RAPOPORT, I.A.

Overcoming the universal mutation barrier with mutations of the X-chromosome exceeding 100%. Dokl. AN SSSR 148 no.3:696-699 Ja '63. (MIRA 16:2)

1. Predstavleno akademikom V.N. Kondrat'yevym.
(Zoology—Variation)

RAPOPORT, I.A.

Mutagenic effect of ethyl mercury thiosalicylate and the mutagenic field. Biul. MOIP. Otd. biol. 69 no.5:112-129 S-O '64.
(MIRA 17:11)

L 29185-66

ACC NR: AP6018848 SOURCE CODE: UR/0020/65/163/002/0483/0485

AUTHOR: Emanuel', N. M. (Corresponding member AN SSSR); Vermel', Ye. M.; Rapoport, I. A.; Kruglyak, S. A.; Dronova, L. M.; Ostrovskaya, L. A. 22 B

ORG: Institute of Chemical Physics, AN SSSR (Institut khimicheskoy fiziki AN SSSR)

TITLE: Antitumor properties 22 of powerful chemical mutagens (nitrosourea derivatives)

SOURCE: AN SSSR. Doklady, v. 163, no. 2, 1965, 483-485

TOPIC TAGS: mouse, tumor, chemotherapy, aromatic hydrocarbon

ABSTRACT: The authors studied the effect of methyl-, ethyl-, and propylnitrosoureas (MNU, ENU, and PNU, respectively) on ascitic strains of mouse tumors (Ehrlich's carcinoma, sarcoma 37, and sarcoma 180) in leukemic mice (C57BL strain) and on solid rat tumors (sarcoma 45, Walker's carcinosarcoma, and sarcoma SSK). Two criteria were used to evaluate the compounds: (1) coefficient of inhibition k, which shows how much more slowly the tumor process develops in experimental animals as compared with the control; (2) percentage of inhibition of tumor growth. The results of the experiments showed that up to 100% inhibition was achieved by all three compounds, but the k values differed. Moreover, MNU and ENU increased the survival time of the animals by 4 days; PNU, by 9 days. Like the polycyclic hydrocarbons, the nitrosourea derivates tested are highly carcinogenic as well as carcinostatic. Orig. art. has: 2 figures. [JPRS]

SUB CODE: 06, 07 / SUBM DATE: 02Mar65 / ORIG REF: 005 / OTH REF: 014

Card 1/1 BLG

RAPOPORT, Iosif Abramovich

[Microgenetics] Mikrogenetika. Moskva, Nauka, 1965.
427 p. (MIRA 18:11)

[illegible]

[illegible] for [illegible]
(MIRA [illegible])

RAPOPORT, I.A.

Mutagenic effect of urethane in gas state and in the presence of oxygen. Genetika no.1:130-141 '65.

Mutagenic effect of diethyl sulfate gas in large volume. Ibid.:142-152 (MIRA 18:10)

1. Institut khimicheskoy fiziki AN SSSR, Moskva.

[illegible] ary [illegible]
[illegible] no.3:359-[illegible] '56.

[illegible]

LYUBINSKAYA, S.I.; RAPOPORT, I.A.; BARTOSHEVICH, Yu.E.

Selecttion of Actinomyces spheroides producing novobiocin. Antibiotiki 10 no.6:511-517 Je '65.
(MIRA 18:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut antibiotikov, Moskva.

Mutational effect of paranitrosoacetophenylenetriphenylphosphine as related to the additivity of mutational components. Dokl. AN SSSR 160 no.3:707-709 Ja '65.
(MIRA 18:3)

1. Institut khimicheskoy fiziki AN SSSR. Submitted August 21, 1964.

EMANUEL', N.M.; VERMEL', Ye.M.; RAPOPORT, I.A.; KRUGLYAK, S.A.; DRONOVA, L.M.;
OSTROVSKAYA, L.A.

Antieoplastic properties of powerful chemical mutagens (nitrosourea derivatives). Dokl. AN SSSR 163 no.2:483-485 Jl '65. (MIRA 18:7)

1. Institut khimicheskoy fiziki AN SSSR. 2. Chlen-korrespondent AN SSSR (for Emanuel'.

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The use of dichloroethane in extraction processes I. A. Rapoport. *Sbornik Pishchevikan* 1939, 52 91; *Khim. Referat. Zhur.* 1940, No. 3, 88 9.—$C_2H_4Cl_2$ can be substituted for gasoline in the extn. of oils. Substances contg. large amts. of oil and *Ricinus communis* (whose oil is very viscous) must be extd. at higher temps. Under semiplant conditions the extn. with $C_2H_4Cl_2$ is faster than with gasoline. Extn. of bones with $C_2H_4Cl_2$ is better at higher temp. $C_2H_4Cl_2$ is a good solvent for extg. asphaltites from bituminous minerals. It can also be used for extg. montan wax from brown coals. Better results are obtained with a mixt. of alc. and $C_2H_4Cl_2$ than with the components used separately. Montan wax is best extd. at 60°. Extn. with $C_2H_4Cl_2$ did decrease the fuel value of the coal. Montan wax extd. with $C_2H_4Cl_2$ has a normal m. p. and acid no., but a slightly higher than normal sapon. no. $C_2H_4Cl_2$ can also be used for extg. S from poor ores, alkaloids from plants, rosin from stumps and paraffin from mineral oils. Corrosion of app. by $C_2H_4Cl_2$ is very slight. W. R. H.

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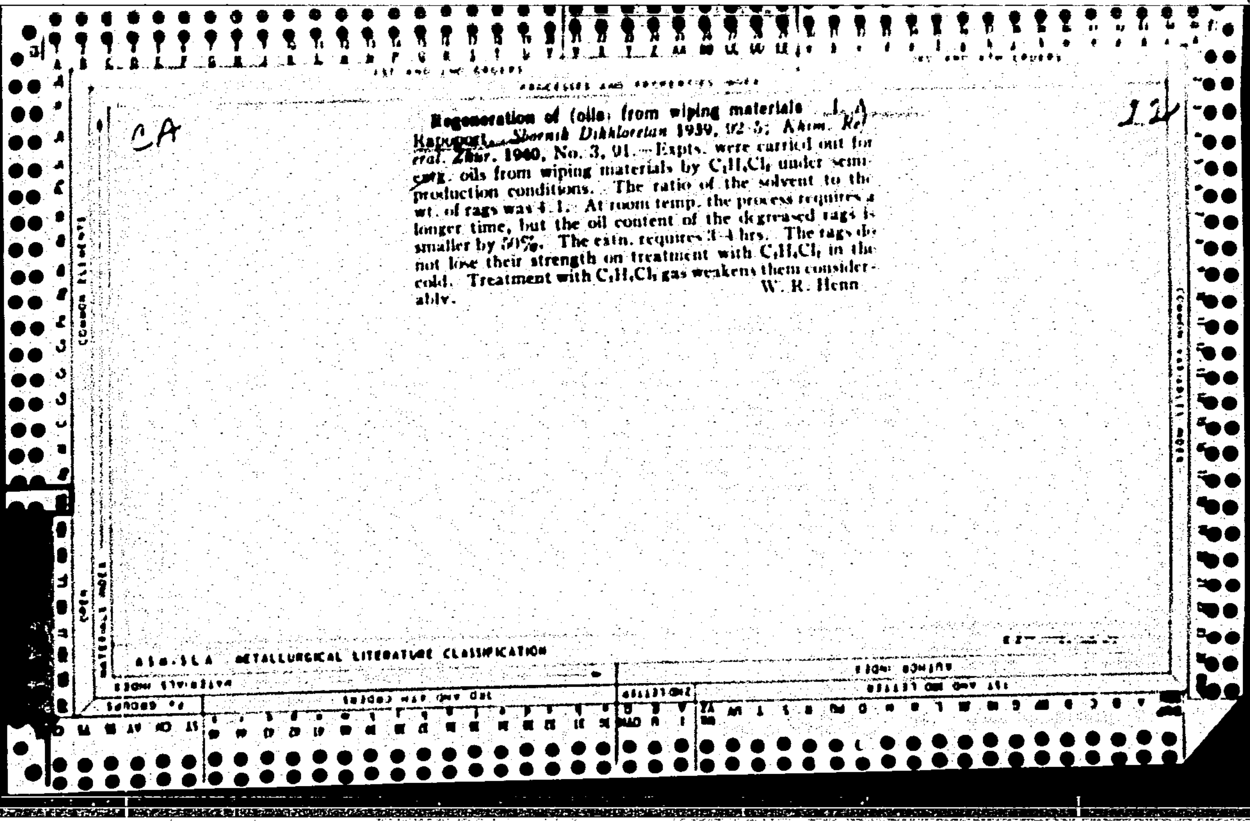

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Regeneration of oils from wiping materials. I. A. Rapoport. *Sbornik Dikhloretan* 1939, 92-5; *Khim. Referat. Zhur.* 1940, No. 3, 91.—Expts. were carried out for extg. oils from wiping materials by $C_2H_4Cl_2$ under semiproduction conditions. The ratio of the solvent to the wt. of rags was 4:1. At room temp. the process requires a longer time, but the oil content of the degreased rags is smaller by 50%. The extn. requires 3-4 hrs. The rags do not lose their strength on treatment with $C_2H_4Cl_2$ in the cold. Treatment with $C_2H_4Cl_2$ gas weakens them considerably.

W. R. Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

RAPOPORT, I.A.

The rate of 75% sex-linked mutations induced by diethyl sulfate as a criterion of the nonroentgenomimetic mechanism. Biul MOIP. Otd. biol. 68 no.5:103-108 S-O '63. (MIRA 16:10)

RAPOPORT, I.A.

Piperidine carbinol as a strong mutagen and the possibility of decoding the mutation mechanism of formaldehyde. Dokl. AN SSSR 159 no.6:1399-1401 D '64 (MIRA 18:1)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom N.N. Semenovym.

PROCESSES AND PROPERTIES INDEX

Production and use of montan wax from Ukrainian brown coals. I. A. Rapoport and I. E. Nehmark. [illegible] [illegible] Prom. S. S. S. R. 1939, No. 8, 17-20. A review. At present the manuf. of crude montan wax is well under way. Lab. expts. on refining the crude wax have been satisfactory, the yields were as high as 15.55%, and the quality of the wax is claimed to be as good as the imported carnauba wax. Twenty-eight references.

H. Z. Kamich

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

C4

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Extracting wool-spinning waste with dichloroethane. I. A. Rapoport. *Sherstyanoe Delo* 1939, No. 12, 20-2; *Khim. Referat. Zhur.* 1940, No. 6, 119.—Parallel expts. for extg. waste in the Soxhlet app. (5 g. in 3 hrs.) and in the Zakhenko app. (3 g. in 1.5 hrs.) with a mixt. of $C_2H_4Cl_2$ and alc. (3:1), with $C_2H_4Cl_2$ alone, with benzene, with gasoline (70-85° fraction), with Et_2O and with Me_2CO indicate that $C_2H_4Cl_2$ is the best oil-extg. solvent. Expts. under semiplant conditions for extg. at room temp. and at 80° indicate that 90% of the oil was extd. at each temp. Tech. calcns. for extg. with $C_2H_4Cl_2$ are given. The oil extd. was a dark-brown viscous mass of characteristic odor. It has acid no. 101, sapon. no. 160.7 and ash content 1.6%. It can be used in soap production and for other tech. purposes. W. R. Henn

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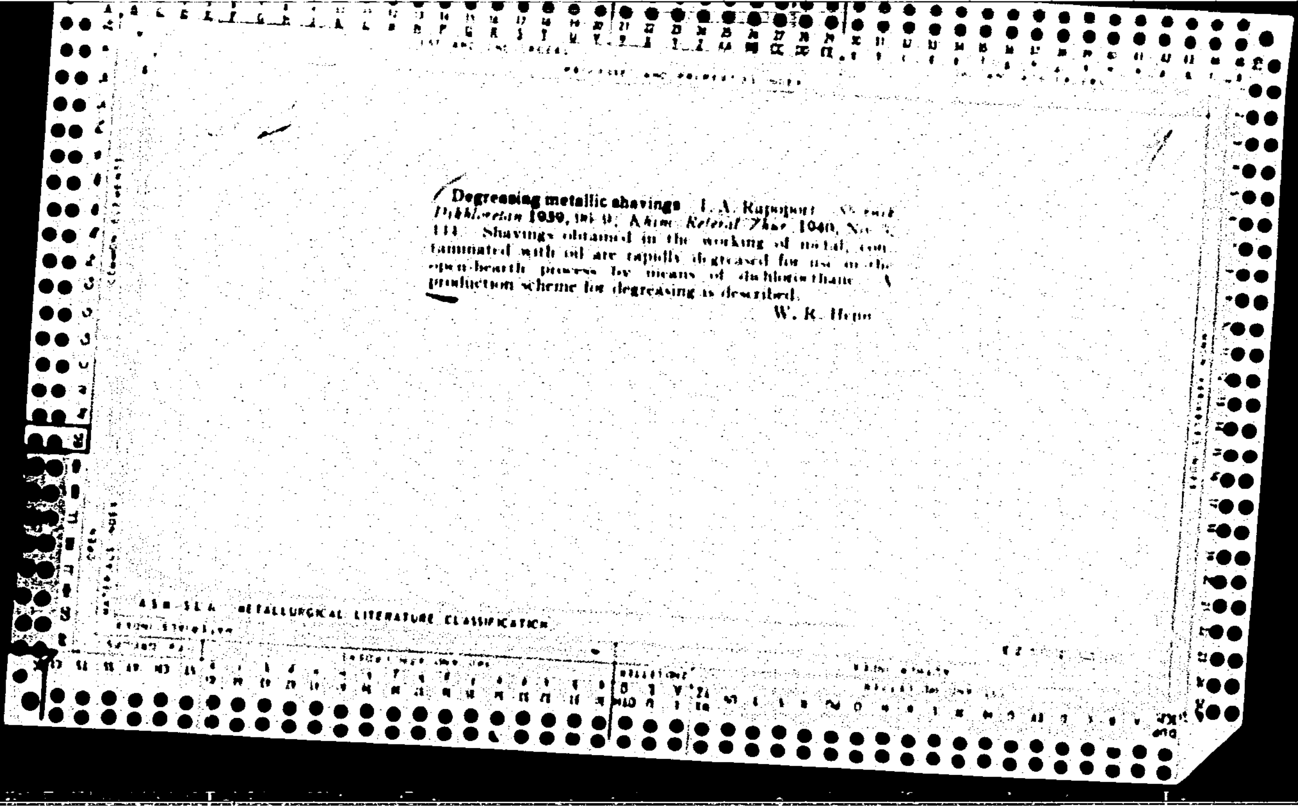

Degreasing metallic shavings. I. A. Rapoport. [illegible] 1939, No. 9; *Khim. Referat. Zhur.* 1940, No. 5, 111.—Shavings obtained in the working of metal, contaminated with oil are rapidly degreased for use in the open-hearth process by means of dichloroethane. A production scheme for degreasing is described.

W. R. Henn

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